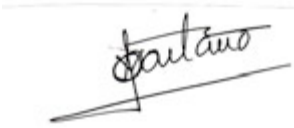
STUDY OF THE EFFECTIVENESS OF THE SYSTEM FUV "STERILRAY" ON THE ELIMINATION OF SOME VIRUS

Dr. Victor Manuel Castaño Meneses

Applied Physics and Center for Advanced Technology
Universidad Nacional Autonoma de Mexico
Juriquilla Campus, Queretaro

Dr. Nora Elizondo Villarreal
MSc. Jesus Arriaga

School of Physics and Mathematics
Universidad Autonoma de Nuevo Leon
Monterrey, Nuevo León



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Experimental development, results and discussion

a). MS-2 Virus

The equipment provided (Sterilray) was tested both with and without water, using as its primary model MS-2 virus, bacteriophage icosaedral well known and can spread, as reported in the literature, through E. coli ATCC 15597. This is a virus of group IV Leviviridae Family, Genus and Species Bacteriophage MS2 Levivirus. Importantly, this virus has become a benchmark as an indicator of mutation, which makes it very interesting for this type of epidemiological studies.

According to a study by the EPA (Environmental Protection Agency) United States (Report 811-R-96-002), the use of ultraviolet light generated by conventional mercury lamps allows average of 4.3 log reduction, provided using an irradiance greater than 128 mJ/cm2.

Were used for comparative purposes, three teams:

1.-Light Sterilray
2.-lamp mercury vapor at 253.7 nm
3.-lamp 259 nm

Virus samples were prepared in two ways:

1.-In water
2 .- "On Air" suspended in a thin layer of water, in order to minimize the effect of H2O on the test.

Irradiance levels in the three cases were calculated to be equivalent.

Were placed 44 ml of sterile water with viruses and 4 ml were removed as a control.

Irradiances were calculated taking into account the relative position of the detector, the distance, the intensity and the irradiated area, to have a standardized method.

Test were performed 8 and 8 control samples in each case.

The results were:

Sterilray in air:
Dose: 40 mJ/cm2; count reduction: log 5
Dose: 60 mJ/cm2; count reduction: log. 6.5

253.7 nm light in air:
Dose: 60 mJ/cm2; count reduction: log 4

Lamp of 259 nm in air:
Dose: 60 mJ/cm2; count reduction: log 4

Sterilray in water:
Dose: 60 mJ/cm2; count reduction: 3.2 log

253.7 nm light in water:
Dose: 60 mJ/cm2; count reduction: log 2

Lamp of 259 nm in water:
Dose: 60 mJ/cm2; count reduction: 2.2 log

In general, there was a significant improvement in effectiveness will kla virus removal using Sterilray lamp. The results indicate a factor of 10 to 1000 times more effectively.

Irradiances were calculated taking into account the relative position of the detector, the distance, the intensity and the irradiated area, to have a standardized method.

8 controls were used and 8 repetitions.
b) Virus Feline Calicivirus

For the culture medium used 5 ml of serum, which was dissolved at 108, 104 and 104 using buffered saline.

0.5 l of petriμml were prepared for each virus suspension and placed drops of 20 dishes.

The results were:

Control 108: 7.38 log TCID50
Control 106: 5.04 log TCID50
104 control: 3.38 log TCID50

Irradiated 108: 1.53 log TCID50
106 Irradiated count below the limit of the device (1.2 log TCID50)$\angle$
104 Irradiated count below the limit of the device (1.2 log TCID50)$\angle$

CONCLUSIONS AND COMMENTS

The results presented represent the first step in a series of tests should be done, but that would require not only epidemiological data and laboratory experiments. That is, the massive use of this technology would not only Sterilray offer a very attractive level of disinfection and effective, according to the results obtained so far, but also the opportunity to conduct field research and the international border, since this technology has been very little used in the world. This would allow high-level original research, maintain a level of public sanitation and position well suited to Queretaro in global leadership in the field, through research supported by large-scale data on the population.

Are in the process, analysis of Ebola, influenza, poliovirus, noroviruses, and others.

It is noteworthy that, according to the literature, the MS-2 virus is the most resistant of all the enteric viruses that affect humans, with the exception of adenovirus, so that the results presented allow an effective display technology.